Request for Economic Stimulus Funds

Concept Proposal

Submitters (Name of Workgroup & Chair/Co-Chairs): **Energy and Sustainability – (Dr. Doug Whitlock and Dr. Jim Tracy)**

Project Title: **Methane Digester/Electricity Generation Scale-up Project**

Project Partners (Known or Anticipated): **Organic Alchemy, LLC, Dr. Nevil Speer, USDA/ARS, and WKU.**

Project Background & Purpose (Justification for Project): Animal waste management is increasingly a pertinent issue for maintaining the viability and productivity for animal agriculture within the Commonwealth. Agriculture must adopt practical but innovative methods of waste disposal that enhance environmental sustainability while also maintaining economic viability for all stakeholders with agribusiness. Conversion of animal waste to usable energy and enhanced fertilizer is a viable endeavor towards a systemic approach of maintaining environmental and economic viability.

WKU in cooperation with the USDA/ARS is currently participating in several joint ventures with corporations to address the issue(s) outlined above. One such project revolves around implementation of a methane digester/electricity generator at WKU's Large Animal Evaluation Center (LAEC). The LAEC provides the opportunity for cattle –namely stocker calves- to be managed in a relatively tightly confined area for research or enhanced production. The facility has been designed and allows for manure production that can be readily contained and collected. Such waste management facilitates the input of manure into the methane digester. The demonstration project is designed to provide direct and indirect relative to best management practices to achieve:

1. Reduction of animal waste produced needing distribution and/or disposal subsequently
2. Prevention of soil and ground water contamination, and
3. Production of methane gas for electricity generation (thus potentially providing an additional economic asset for agricultural producers.

At this time we have a demonstration methane digester already producing methane from cattle manure. The digester was designed and built by a local entrepreneur who formed Organic Alchemy, LLC. WKU and the USDA/ARS are currently collecting data to determine optimal conditions for production of methane. Plans to build a larger scale unit to increase the animal holding capacity of the LAEC to demonstrate to farmers. The LAEC is already showing farmers

in Kentucky how to make more money per head. With over 1.2 million head of cattle in Kentucky, this could have a tremendous positive economic impact. In addition, we plan on collecting the effluent and dewatering it using technology developed by a second company (Gryphon, Inc). The dried solids can be charred using existing technology at the Institute of Combustion Science and Technology to produce additional energy without adding CO_2 to the atmosphere. The nutrient containing water will be used to grow algae for oil for biodiesel production, for hydroponic gardening, or application to the field. These technologies currently exist or are under development. Ultimately the goal is to serve as an innovation and demonstration center for farmers whereby they could learn how to manage their animal waste in an environmentally friendly way that improves their bottom line.

Project Description (General Goals & Implementation Strategies):
Scale-up an existing demonstration methane digester unit that will be used to provide electricity. The location for the scale-up is being prepared and optimal conditions for the digester in terms of producing methane without unwanted byproducts is underway.

Project Team (Project Manager(s), Content Experts, Instructional Designers, etc.):
Organic Alchemy, LLC and investors, Dr. Nevil Speer, Richard Vetter (consultant), USDA/ARS scientists, and Mr. David Newsom who is in charge of the WKU farm beef cattle.

Project Budget & Amount of Economic Stimulus Funds Requested:

Scale-up of the methane digester for large-scale methane production from a Concentrated Animal Feeding Operation (CAFO), or dairies in Kentucky	Stimulus Package:	$250,000